Space Weather Forecast

Issued on Thursday, 29 February 2024 at 13:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing risk of further Moderate or Strong flares from the large sunspot in the northwest.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate during the last 24 hours with a long period Moderate flare from the large sunspot in the northwest. There are seven sunspot regions on the disc. The largest and most significant potential flare source remains the region in the northwest, with a complex magnetic structure and significant flare potential. The other regions are smaller, and generally simpler however the spot in the central northern disk has seen ongoing growth and remains a watch point.

A CME associated with the long period Moderate flare has been analysed, and is expected to pass ahead of Earth with no significant impact. A second southward directed CME from the south of the disk has been analysed and we await model output.

Solar Wind / Geomagnetic Activity: Solar winds showed a minor enhancement - perhaps some limited fast wind influence. Wind speeds were mostly slightly elevated, varying between 380-460 km/s, but on a slowly declining trend. The interplanetary magnetic field was weak throughout, with the important north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with isolated Moderate-class flares likely. There remains a slight chance of further Strong flares from the large sunspot in the northwest throughout.

Solar Wind / Geomagnetic Activity: There are three recent CMEs which are all most likely to miss Earth, but with a risk of some glancing influence, most likely on Day 3 (02 Mar), perhaps extending into Day 4 (03 Mar). Solar winds may become slightly elevated in the near term, but otherwise no further notable enhancements are expected and winds in the absence of CME enhancement expected to remain generally at background.

Geomagnetic activity is therefore forecast to be mostly Quiet, perhaps increasing to give Unsettled to Active intervals with any CME influence on Days 3 and 4 (02-03 Mar), with a Slight Chance of an isolated G1 Minor Geomagnetic storm interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, but with a slight chance of rising above the

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S1/Minor Radiation Storm threshold in response to any notable flares from the large sunspot in the northwest of the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	50
Very Active	R3 to R5 X	No	20	20	20	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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